

Town of Andover Retirement System

*Actuarial Valuation and Review
as of January 1, 2004*

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November 15, 2004

*Retirement Board
Town of Andover Retirement System
Town Offices
Bartlet Street
Andover, MA 01810*

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2004. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2005 and later years and analyzes the preceding three years' experience.

The census information and financial information on which our calculations were based was prepared by the staff of the Andover Retirement System. That assistance is gratefully acknowledged. The actuarial calculations were completed under my supervision.

This actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

THE SEGAL COMPANY

By:

*Kathleen A. Riley, FSA, MAAA, EA
Senior Vice President and Actuary*

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SECTION 1: Valuation Summary for the Town of Andover Retirement System

Purpose

This report has been prepared by The Segal Company to present a valuation of the Town of Andover Retirement System as of January 1, 2004. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of M.G.L. Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of January 1, 2004;
- The assets of the Plan as of December 31, 2003;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- The actuarial valuation report as of January 1, 2004 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected.
- During the plan years ended 2001, 2002 and 2003, the market value rates of return were -5.25%, -10.89% and 14.57%, respectively. Because the actuarial value of assets gradually recognizes market value fluctuations over a five-year period, the actuarial rates of return for the plan years ended 2001, 2002 and 2003 were 6.53%, -0.75% and 5.91%, respectively. The actuarial value of assets as of December 31, 2003 was \$81.4 million, or 110.8% of the market value of assets.
- As indicated in Section 2, Subsection B of this report, the total unrecognized investment loss as of December 31, 2003 is \$7.9 million. This investment loss will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent it is not offset by recognition of investment gains derived from future experience. This implies that earning the assumed rate of investment return of 8.50% per year (net of expenses) on a **market value** basis will result in investment losses on the actuarial value of assets in the next few years. Therefore, if the actual market return is equal to the assumed 8.50% rate and all other actuarial assumptions are met, the contribution requirements would still increase in each of the next few years.

SECTION 1: Valuation Summary for the Town of Andover Retirement System

- The unfunded liability has increased from \$17.2 million as of January 1, 2001 to \$22.8 million as of January 1, 2004. Over this time period, the unfunded liability was expected to decrease by approximately \$2.0 million. The increase is primarily due to an investment loss of \$11.3 million, partially offset by favorable salary and demographic experience.
- The recommended contribution for fiscal 2005 is the Town's budgeted amount of \$3,591,737. The results of this valuation will first be reflected in the fiscal 2006 appropriation which has been determined to be \$3,953,830. The 1992 ERI liability will be fully funded in fiscal 2008. The remaining unfunded liability is amortized over a 20-year schedule (by June 30, 2024) with payments that increase at 3.0% per year. The prior schedule fully funded the System by June 30, 2018 with amortization payments that increased 1.5% per year. In addition, the fiscal 2005, 2006 and 2007 appropriations will be paid earlier in the year, reducing the interest charges on the payment.

SECTION 1: Valuation Summary for the Town of Andover Retirement System

Summary of Key Valuation Results

	2004	2001
Contributions:		
Recommended for fiscal 2005 and 2002	\$3,591,737	\$3,773,200
Recommended for fiscal 2006 and 2003	3,953,830	3,519,677
Recommended for fiscal 2007 and 2004	4,100,686	3,623,802
Funding elements for plan year beginning January 1:		
Normal cost, including administrative expenses	\$4,298,319	\$3,562,404
Market value of assets	73,517,618	72,645,821
Actuarial value of assets	81,431,072	69,751,698
Actuarial accrued liability	104,231,898	86,927,975
Unfunded actuarial accrued liability	22,800,826	17,176,277
GASB 25/27:		
Annual required contributions	\$3,591,737	\$3,773,200
Actual contributions	--	3,773,200
Percentage contributed	--	100.00%
Funded ratio	78.12%	80.24%
Demographic data for plan year beginning January 1:		
Number of retired participants and beneficiaries	334	318
Number of inactive participants	99	88
Number of active participants	720	664
Total payroll	\$27,550,741	\$23,203,565
Average payroll	38,265	34,945

SECTION 2: Valuation Results for the Town of Andover Retirement System

A. PARTICIPANT DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A and B.

A historical perspective of how the participant population has changed over the past four valuations can be seen in this chart.

CHART 1

Participant Population: 1994 – 2003

Year Ended December 31	Active Participants	Inactive Participants	Retired Participants and Beneficiaries
1994	512	6	285
1997	597	47	293
2000	664	88	318
2003	720	99	334

SECTION 2: Valuation Results for the Town of Andover Retirement System

Active Participants

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 720 active participants with an average age of 45.9, average years of service of 9.3 years and average payroll of \$38,265. The 664 active participants in the prior valuation had an average age of 44.8, average service of 9.6 years and average payroll of \$34,945.

Among the active participants, there were none with unknown age and/or service information.

Inactive Participants

In this year's valuation, there were 99 participants with a vested right to a deferred or immediate vested benefit or entitled to a return of their employee contributions.

These graphs show a distribution of active participants by age and by years of service.

CHART 2

Distribution of Active Participants by Age as of December 31, 2003

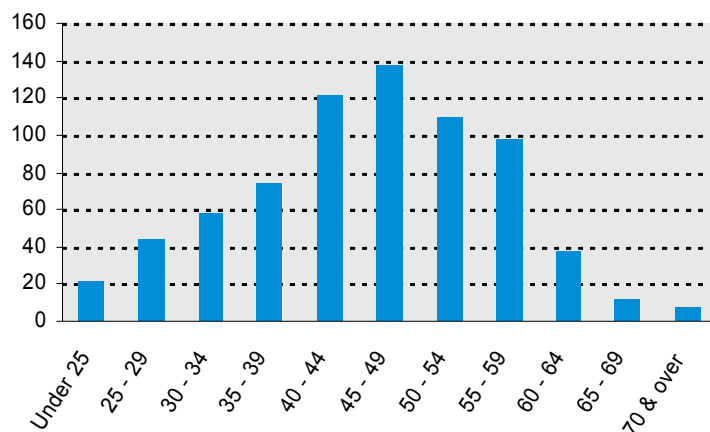
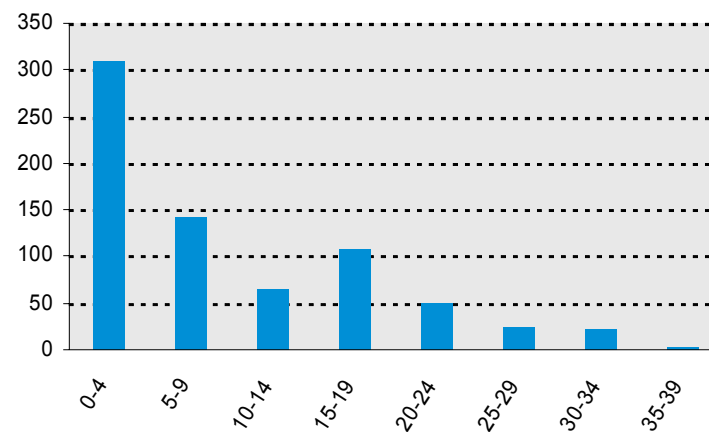


CHART 3

Distribution of Active Participants by Years of Service as of December 31, 2003



SECTION 2: Valuation Results for the Town of Andover Retirement System

Retired Participants and Beneficiaries

As of December 31, 2003, 290 retired participants and 44 beneficiaries were receiving total monthly benefits of \$417,293, excluding COLAs reimbursed by the Commonwealth. For comparison, in the previous valuation, there were 272 retired participants and 46 beneficiaries receiving monthly benefits of \$326,965.

These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.

CHART 4

Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of December 31, 2003

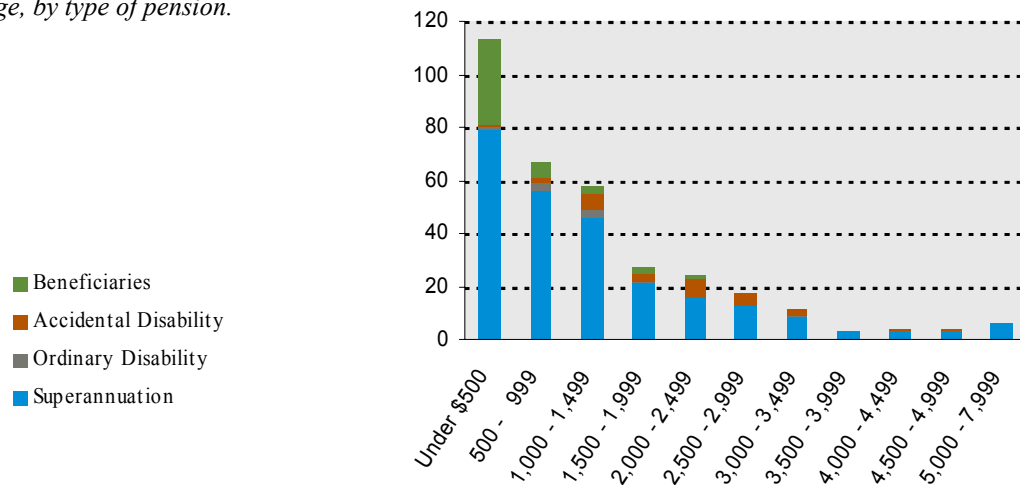
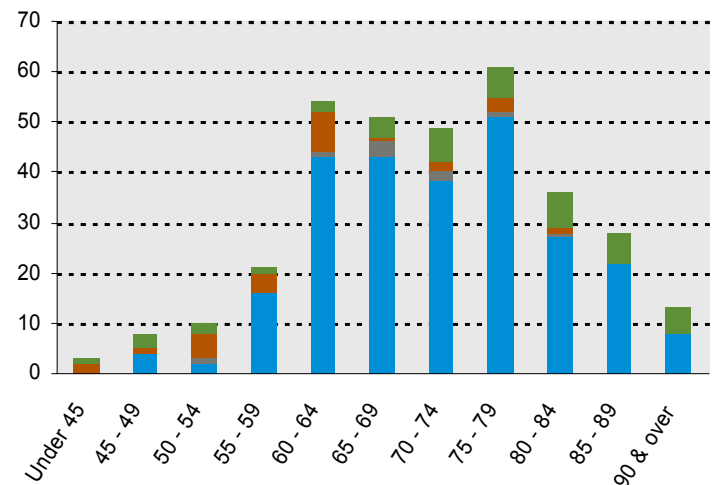


CHART 5

Distribution of Retired Participants and Beneficiaries by Type and by Age as of December 31, 2003



SECTION 2: Valuation Results for the Town of Andover Retirement System

B. FINANCIAL INFORMATION

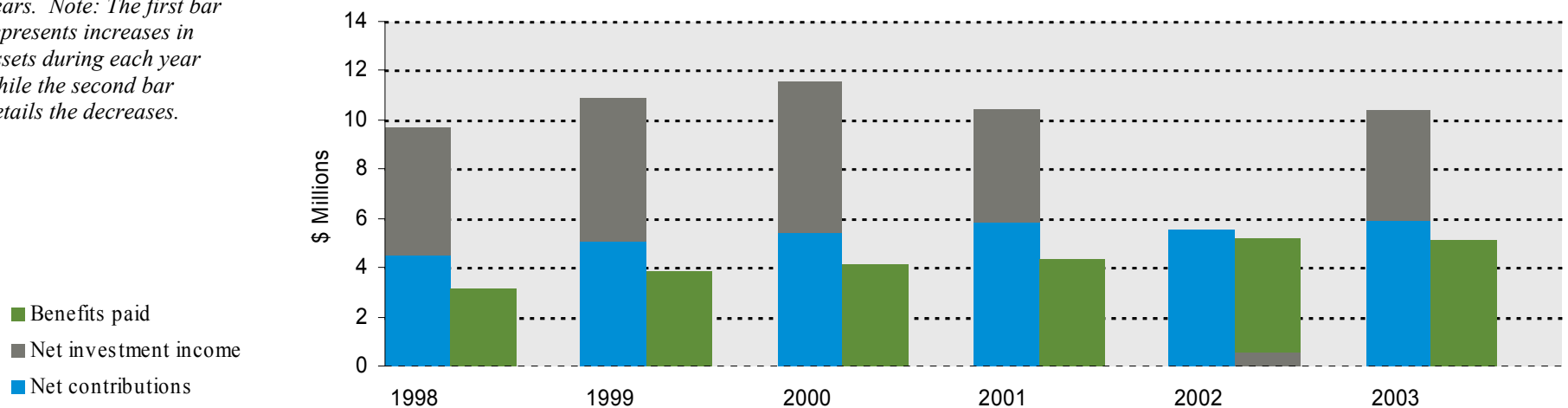
Retirement plan funding anticipates that, over the long term, both net contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits C and D.

The chart depicts the components of changes in the actuarial value of assets over the last six years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.

CHART 6

Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended December 31, 1998 – 2003



SECTION 2: Valuation Results for the Town of Andover Retirement System

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

The chart shows the determination of the actuarial value of assets as of the valuation date.

CHART 7

Determination of Actuarial Value of Assets

	Year Ended December 31,		
	2003	2002	2001
1. Actuarial value of assets	\$76,132,711	\$75,799,475	\$69,751,698
2. Contributions, less benefit payments and expenses during the year	772,608	901,610	1,446,877
3. Average actuarial value: (1) + 50% of (2)	76,519,015	76,250,280	70,475,137
4. Expected investment income: .085 x (3)	6,504,116	6,481,274	5,990,387
5. Preliminary actuarial value of assets at the end of the year: (1) + (2) + (4)	83,409,435	83,182,359	77,188,962
6. Market value of assets at the end of the year	73,517,618	63,443,926	70,241,528
7. Adjustment toward market value: 20% of [(6) - (5)]	-1,978,363	-3,947,687	-1,389,487
8. Adjustment to be within 20% corridor	0	-3,101,961	0
9. Final actuarial value of assets: (5) + (7) + (8)	<u>\$81,431,072</u>	<u>\$76,132,711</u>	<u>\$75,799,475</u>
10. Actuarial value as a percentage of market value: (9) ÷ (6)	110.8%	120.0%	107.9%

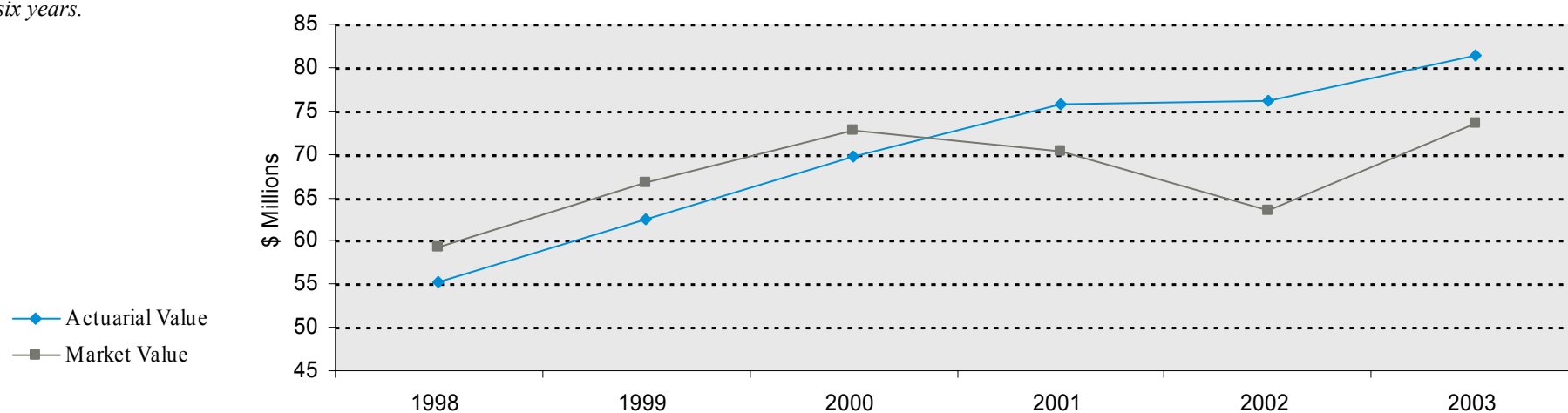
SECTION 2: Valuation Results for the Town of Andover Retirement System

Both the actuarial value and market value of assets are representations of the Andover Retirement System's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Andover Retirement System's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in the actuarial value of assets versus the market value over the past six years.

CHART 8

Actuarial Value of Assets vs. Market Value of Assets as of December 31, 1998 – 2003



SECTION 2: Valuation Results for the Town of Andover Retirement System

C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total gain/(loss) is -\$7,596,361, -\$11,262,970 from investments and \$3,666,609 from all other sources. A discussion of the major components of the actuarial experience is on the following pages.

This chart provides a summary of the actuarial experience during the past year.

CHART 9

Actuarial Experience for Year Ended December 31, 2003

1. Net (loss) from investments*	-\$11,262,970
2. Net gain from administrative expenses	70,613
3. Net gain from other experience**	<u>3,595,996</u>
4. Net experience (loss): (1) + (2) + (3)	-\$7,596,361

* Details in Chart 10

** Details in Chart 13

SECTION 2: Valuation Results for the Town of Andover Retirement System

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Andover Retirement System's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 8.50%. The actual rate of return on an actuarial basis was 5.91% for the 2003 plan year, -0.75% for the 2002 plan year and 6.53% for the 2001 plan year.

Since the actual return for the past three years was less than the assumed return, the Andover Retirement System experienced an actuarial loss during the three-year period ended December 31, 2003 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 10

Actuarial Value Investment Experience

	Year Ended December 31,		
	2003	2002	2001
1. Net investment income	\$4,525,753	-\$568,374	\$4,600,900
2. Average actuarial value of assets	76,519,015	76,250,280	70,475,137
3. Rate of return: (1) ÷ (2)	5.91%	-0.75%	6.53%
4. Assumed rate of return	8.50%	8.50%	8.50%
5. Expected net investment income: (2) x (4)	\$6,504,116	\$6,481,274	\$5,990,387
6. Actuarial gain/(loss): (1) – (5)	<u>-\$1,978,363</u>	<u>-\$7,049,648</u>	<u>-\$1,389,487</u>

SECTION 2: Valuation Results for the Town of Andover Retirement System

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last six years, including a five-year average.

Based upon this experience and future expectations, we have maintained the assumed rate of return of 8.50%.

CHART 11

Investment Return – Actuarial Value vs. Market Value: 1998 - 2003

Year Ended December 31	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
1998	\$5,204,018	10.52	\$9,204,945	18.61
1999	5,838,935	10.44	6,170,214	10.29
2000	6,081,236	9.65	4,643,153	6.89
2001	4,600,900	6.53	-3,851,155	-5.25
2002	-568,374	-0.75	-7,699,213	-10.89
2003	<u>4,525,753</u>	5.91	<u>9,301,084</u>	14.57
Total	\$25,682,468		\$17,769,028	
	Five-year average return	5.99%		2.55%

Note: Each year's yield is weighted by the average asset value in that year.

SECTION 2: Valuation Results for the Town of Andover Retirement System

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

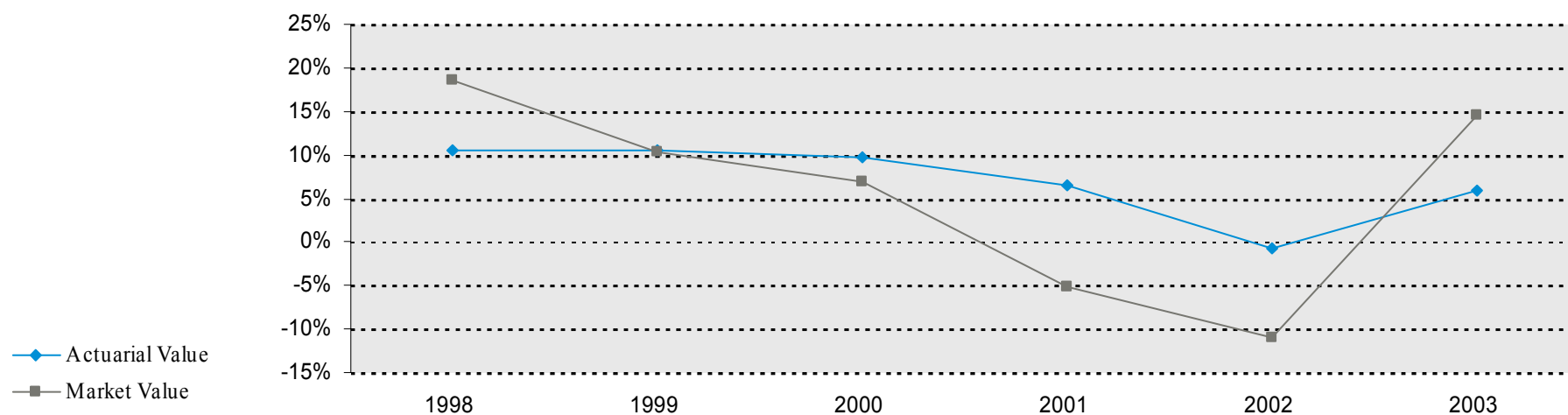
Administrative Expenses

Administrative expenses for the years ended December 31, 2001, 2002 and 2003 were \$58,225, \$159,747 and \$76,340, respectively, compared to the assumption of \$108,900 for 2001, \$113,800 for 2002 and \$118,900 for 2003. This resulted in a gain of \$70,613 for the three-year period, including an adjustment for interest. We have assumed that the administrative expenses will be \$108,900 for 2004.

This chart illustrates how this leveling effect has actually worked over the years 1998 - 2003 .

CHART 12

Market and Actuarial Rates of Return for Years Ended December 31, 1998 - 2003



SECTION 2: Valuation Results for the Town of Andover Retirement System

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),

- the number of disability retirements, and
- salary increases different than assumed.

The net gain from this other experience for the year ended December 31, 2003 amounted to \$3,595,996 which is 3.45% of the actuarial accrued liability.

The chart shows elements of the experience gain/(loss) for the most recent year.

CHART 13

Experience Due to Changes in Demographics for Year Ended December 31, 2003

1. Salary increases less than expected	\$1,415,934
2. Miscellaneous gain	<u>2,180,062</u>
3. Net gain	\$3,595,996

SECTION 2: Valuation Results for the Town of Andover Retirement System

D. RECOMMENDED CONTRIBUTION

The amount of annual contribution required to fund the Plan is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability.

The preliminary recommended contribution for fiscal 2005 of \$3,797,352 amortizes the 1992 ERI liability over a 4-year period in level dollar payments. The remaining unfunded liability is amortized in increasing (3.0% per year) payments over 20 years. The System will be fully funded by June 30, 2024. The fiscal 2005 appropriation has been set to the previously budgeted amount of

\$3,591,737. Therefore, the impact of this valuation will first be reflected in the fiscal 2006 appropriation of \$3,953,830.

The prior funding schedule fully funded the System by June 30, 2018 with amortization payments that increased 1.5% per year.

Exhibit G in Section 3 shows the recommended contribution through fiscal 2028 based on the new funding schedule.

The chart compares this valuation's recommended contribution with the prior valuation.

CHART 14

Recommended Contribution

	Year Beginning January 1			
	2004		2001	
	Amount	% of Payroll	Amount	% of Payroll
1. Total normal cost	\$4,189,419	14.35%	\$3,453,504	14.04%
2. Administrative expenses	108,900	0.37%	108,900	0.44%
3. Expected employee contributions	<u>-2,472,920</u>	<u>-8.46%</u>	<u>-2,004,525</u>	<u>-8.15%</u>
4. Employer normal cost: (1) + (2) + (3)	\$1,825,399	6.26%	\$1,557,879	6.33%
5. Actuarial accrued liability	104,231,898		86,927,975	
6. Actuarial value of assets	<u>81,431,072</u>		<u>69,751,698</u>	
7. Unfunded actuarial accrued liability: (5) - (6)	\$22,800,826		\$17,176,277	
8. Employer normal cost projected to July 1, 2004 and 2001, adjusted for timing	1,885,145	6.33%	1,658,849	6.60%
9. Projected unfunded actuarial accrued liability	23,750,100		17,891,383	
10. Payment on projected unfunded actuarial accrued liability, adjusted for timing	1,912,207	6.42%	1,794,115	7.14%
11. Preliminary recommended contribution: (8) + (10)	3,797,352	12.74%	3,452,962	13.73%
12. Budgeted appropriation	<u>\$3,591,737</u>	<u>12.05%</u>	<u>\$3,773,200</u>	<u>15.01%</u>
13. Projected payroll	\$29,804,500		\$25,143,094	

Notes: Fiscal 2005 appropriation assumed to be paid on August 1, 2004 as reported by PERAC.

Fiscal 2006 and fiscal 2007 appropriations are assumed to be paid on August 15.

Subsequent appropriations are assumed to be paid on December 31.

SECTION 2: Valuation Results for the Town of Andover Retirement System

Reconciliation of Recommended Contribution

The chart below details the changes in the recommended contribution from the prior valuation to the current year's valuation.

The chart reconciles the contribution from the prior valuation to the amount determined in this valuation.

CHART 15

Reconciliation of Recommended Contribution from July 1, 2001 to July 1, 2004

Budgeted Appropriation as of July 1, 2001	\$3,773,200
Expected change	-\$41,370
Effect of investment loss	1,299,159
Effect of change in amortization schedule	-686,249
Effect of payment earlier in fiscal year	-117,972
Effect of net other changes	<u>-429,416</u>
Total change	<u>\$24,152</u>
Preliminary Recommended Contribution as of July 1, 2004	\$3,797,352
Budgeted Appropriation as of July 1, 2004	\$3,591,737

SECTION 2: Valuation Results for the Town of Andover Retirement System

E. INFORMATION REQUIRED BY THE GASB

Governmental Accounting Standards Board (GASB) reporting information provides standardized information for comparative purposes of governmental pension plans. This information allows a reader of the financial statements to compare the funding status of one governmental plan to another on relatively equal terms.

Critical information to GASB is the historical comparison of the GASB required contribution to the actual contributions. This comparison demonstrates whether a plan is being funded on an actuarially sound basis and in accordance with the GASB funding requirements. Chart 16 below presents a graphical representation of this information for the Plan.

The other critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the plan as calculated under GASB. High ratios indicate a well-funded plan with assets sufficient to pay most benefits. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other changes.

The details regarding the calculations of these values and other GASB numbers may be found in Section 4, Exhibits II, III, and IV.

These graphs show key GASB factors.

CHART 16
Required Versus Actual Contributions

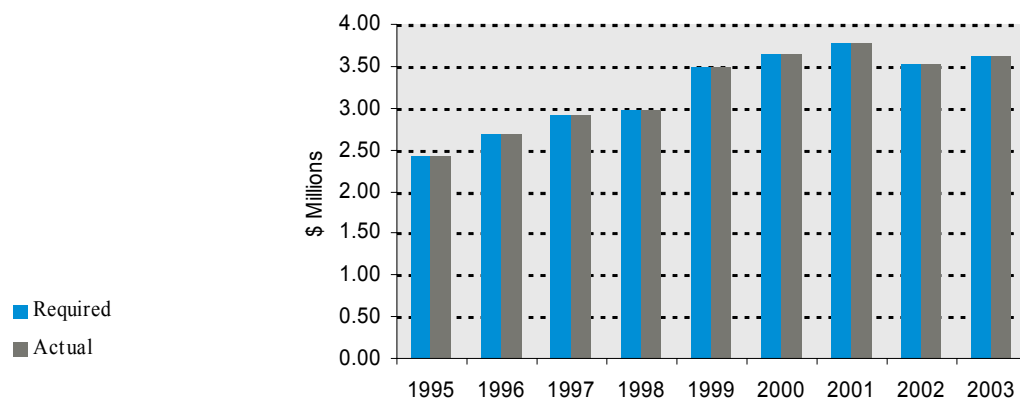
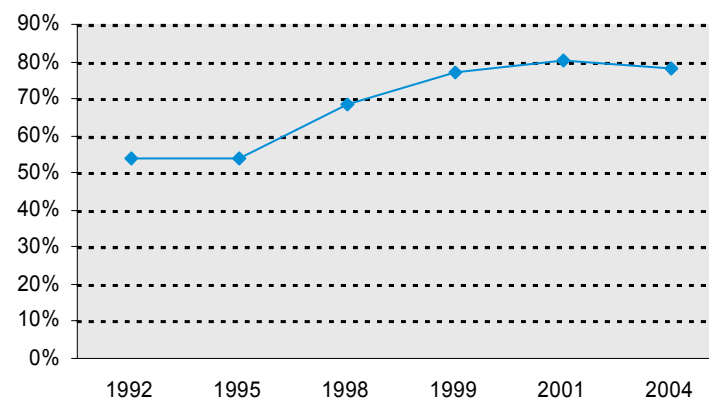


CHART 17
Funded Ratio



SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT A

Table of Plan Coverage

Category	Year Ended December 31		Change From Prior Year
	2003	2000	
Active participants in valuation:			
Number	720	664	8.4%
Average age	45.9	44.8	N/A
Average service	9.3	9.6	N/A
Total payroll	\$27,550,741	\$23,203,565	18.7%
Average payroll	38,265	34,945	9.5%
Account balances	21,506,803	16,892,593	27.3%
Inactive participants with a vested right to a return of their employee contributions or a deferred or immediate benefit			
	99	88	12.5%
Retired participants:			
Number in pay status	254	242	5.0%
Average age	72.0	72.1	N/A
Average monthly benefit	\$1,290	\$1,089	18.5%
Disabled participants:			
Number in pay status	36	30	20.0%
Average age	62.6	63.3	N/A
Average monthly benefit	\$1,871	\$1,446	29.4%
Beneficiaries in pay status	44	46	-4.3%

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT B

**Participants in Active Service as of December 31, 2003
By Age, Years of Service, and Average Payroll**

Age	Years of Service								
	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39
Under 25	21	21	--	--	--	--	--	--	--
	\$22,414	\$22,414	--	--	--	--	--	--	--
25 - 29	44	38	6	--	--	--	--	--	--
	\$30,524	\$27,184	\$51,678	--	--	--	--	--	--
30 - 34	58	28	25	5	--	--	--	--	--
	\$46,923	\$41,466	\$53,025	\$46,971	--	--	--	--	--
35 - 39	74	36	12	8	18	--	--	--	--
	\$40,556	\$27,380	\$47,045	\$47,887	\$59,325	--	--	--	--
40 - 44	121	56	25	6	28	6	--	--	--
	\$35,633	\$22,064	\$39,559	\$44,409	\$52,769	\$57,182	--	--	--
45 - 49	137	58	30	7	19	18	5	--	--
	\$34,681	\$18,194	\$32,708	\$51,070	\$49,253	\$63,217	\$56,739	--	--
50 - 54	109	34	19	13	17	13	7	6	--
	\$40,629	\$24,089	\$32,461	\$38,718	\$42,276	\$70,069	\$64,520	\$68,042	--
55 - 59	98	25	20	15	12	7	7	10	2
	\$46,463	\$27,700	\$35,255	\$53,707	\$43,297	\$56,948	\$71,841	\$79,498	\$67,046
60 - 64	38	9	4	8	10	2	1	4	--
	\$35,528	\$25,347	\$32,844	\$32,389	\$35,292	\$63,838	\$40,093	\$52,689	--
65 - 69	12	2	1	2	2	2	2	1	--
	\$36,594	\$11,817	\$49,525	\$28,360	\$50,917	\$45,295	\$37,361	\$42,110	--
70 & over	8	2	--	1	2	1	2	--	--
	\$22,520	\$6,392	--	\$18,610	\$34,490	\$13,779	\$33,002	--	--
Total	720	309	142	65	108	49	24	21	2
	\$38,265	\$24,975	\$39,952	\$44,389	\$48,548	\$61,685	\$59,127	\$69,338	\$67,046

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT C

Summary Statement of Income and Expenses

	Year Ended December 31, 2003	Year Ended December 31, 2002
Contribution income:		
Employer contributions	\$3,623,802	\$3,519,677
Employee contributions	2,353,734	2,201,527
Less administrative expenses	<u>-76,340</u>	<u>-159,747</u>
Net contribution income	\$5,901,196	\$5,561,457
Net investment income	<u>4,525,753</u>	<u>-568,374</u>
Total income available for benefits	\$10,426,949	\$4,993,083
Less benefit payments:		
Pensions and annuities	\$4,938,449	\$4,443,868
Net 3(8)(c) reimbursements	5,169	-25,997
Refunds to members	<u>184,970</u>	<u>241,976</u>
Net benefit payments	\$5,128,588	\$4,659,847
Change in reserve for future benefits	\$5,298,361	\$333,236

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT D

Development of the Fund Through December 31, 2003

Year Ended December 31	Employer Contributions	Employee Contributions	Net Investment Return*	Administrative Expenses	Benefit Payments	Actuarial Value of Assets at End of Year
1998	\$2,976,423	\$1,639,942	\$5,204,018	\$90,983	\$3,148,211	\$55,348,906
1999	3,497,014	1,629,862	5,838,935	83,601	3,837,935	62,393,181
2000	3,646,700	1,854,518	6,081,236	75,566	4,148,371	69,751,698
2001	3,773,200	2,094,035	4,600,900	58,225	4,362,133	75,799,475
2002	3,519,677	2,201,527	-568,374	159,747	4,659,847	76,132,711
2003	3,623,802	2,353,734	4,525,753	76,340	5,128,588	81,431,072

** Net of investment expenses.*

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT E

Development of Unfunded Actuarial Accrued Liability and (Gain)/Loss

	Year Ended December 31,		
	2003	2002	2001
1. Unfunded actuarial accrued liability at beginning of year	\$15,864,689	\$16,389,961	\$17,176,277
2. Normal cost at beginning of year	3,880,213	3,717,812	3,562,404
3. Interest on (1) and (2)	1,678,317	1,709,161	1,762,758
4. Total contributions with interest	<u>-6,218,754</u>	<u>-5,952,245</u>	<u>6,111,508</u>
5. Expected unfunded actuarial accrued liability	\$15,204,465	\$15,864,689	\$16,389,961
6. Actual unfunded actuarial accrued liability at end of year	22,800,826	N/A	N/A
7. (Gain)/loss for three-year period: (6) – (5)	7,596,361	N/A	N/A

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT F

Table of Amortization Bases as of July 1, 2004

Type	Annual Payment	Years Remaining	Outstanding Balance
1992 ERI liability	\$43,625	4.00	\$153,470
Remaining unfunded liability	<u>1,868,582</u>	20.00	<u>23,596,630</u>
Total	\$1,912,207		\$23,750,100

Notes: 1992 ERI liability payment is level; remaining unfunded liability payment is increasing (3.0% per year).

Payments include adjustment for timing.

Does not reflect adjustment to set fiscal 2005 appropriation to budgeted amount.

Refer to Exhibit G for information on payments in fiscal year 2006 and later.

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT G

Funding Schedule

(1) Fiscal Year Ended June 30	(2) Employer Normal Cost	(3) Amortization of 1992 ERI Liability	(4) Amortization of Remaining Liability	(5) Total Plan Cost: (2) + (3) + (4)	(6) Unfunded Actuarial Accrued Liability
2005	\$1,885,145	\$43,625	\$1,662,967	\$3,591,737	\$23,750,100
2006	1,969,976	43,625	1,940,229	3,953,830	23,906,290
2007	2,058,625	43,625	1,998,436	4,100,686	23,807,682
2008	2,218,093	44,980	2,122,333	4,385,406	23,638,178
2009	2,317,907	-	2,186,003	4,503,910	23,389,877
2010	2,422,213	-	2,251,584	4,673,797	23,101,003
2011	2,531,213	-	2,319,131	4,850,344	22,719,264
2012	2,645,118	-	2,388,705	5,033,823	22,234,717
2013	2,764,148	-	2,460,366	5,224,514	21,636,513
2014	2,888,535	-	2,534,177	5,422,712	20,912,817
2015	3,018,519	-	2,610,202	5,628,721	20,050,723
2016	3,154,352	-	2,688,508	5,842,860	19,036,161
2017	3,296,298	-	2,769,164	6,065,462	17,853,795
2018	3,444,631	-	2,852,239	6,296,870	16,486,914
2019	3,599,639	-	2,937,806	6,537,445	14,917,315
2020	3,761,623	-	3,025,940	6,787,563	13,125,170
2021	3,930,896	-	3,116,718	7,047,614	11,088,890
2022	4,107,786	-	3,210,220	7,318,006	8,784,968
2023	4,292,636	-	3,306,526	7,599,162	6,187,818
2024	4,485,805	-	3,405,722	7,891,527	3,269,595
2025	4,687,666	-	-	4,687,666	-
2026	4,898,611	-	-	4,898,611	-
2027	5,119,048	-	-	5,119,048	-
2028	5,349,405	-	-	5,349,405	-

Notes: FY05 appropriation assumed to be paid on August 1, 2004 as reported by PERAC.

Payments for FY06 and FY07 are assumed to be paid on August 15.

Payments for FY08 and thereafter are assumed to be paid on December 31.

SECTION 3: Supplemental Information for the Town of Andover Retirement System

EXHIBIT H

Definitions of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Assumptions or Actuarial

Assumptions:

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Normal Cost:

The amount of contributions required to fund the benefit allocated to the current year of service.

Actuarial Accrued Liability

For Actives:

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial Accrued Liability

For Pensioners:

The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Unfunded Actuarial Accrued

Liability:

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

SECTION 3: Supplemental Information for the Town of Andover Retirement System

Amortization of the Unfunded

Actuarial Accrued Liability: Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

Investment Return:

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

SECTION 4: Reporting Information for the Town of Andover Retirement System

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Retired participants as of the valuation date (including 44 beneficiaries in pay status)	334
2. Participants active during the year ended December 31, 2003 with total accumulated contributions of \$21,506,803 and projected payroll of \$29,155,715	725
3. Inactive participants as of December 31, 2003 with a vested right to a return of their employee contributions or a deferred or immediate benefit	99

The actuarial factors as of the valuation date are as follows:

1. Total normal cost, including administrative expenses	\$4,298,319
2. Expected employee contributions	-2,472,920
3. Employer normal cost: (1) + (2)	1,825,399
4. Actuarial accrued liability	104,231,898
Retired participants and beneficiaries	\$45,264,252
Active participants	58,527,951
Inactive participants	439,695
5. Actuarial value of assets (\$73,517,618 at market value)	81,431,072
6. Unfunded actuarial accrued liability	22,800,826

The actuarial factors are projected to July 1, 2004 as follows:

1. Projected employer normal cost, adjusted for timing	\$1,885,145
2. Projected unfunded actuarial accrued liability	23,750,100
3. Payment on projected unfunded actuarial accrued liability, adjusted for timing	1,912,207
4. Preliminary total recommended contribution: (1) + (3)	3,797,352
5. Budgeted appropriation	3,591,737
5. Projected payroll	29,804,500

Notes: Fiscal 2005 appropriation assumed to be paid on August 1, 2004 as reported by PERAC.

Fiscal 2006 and fiscal 2007 appropriations are assumed to be paid on August 15.

Subsequent appropriations are assumed to be paid on December 31.

SECTION 4: Reporting Information for the Town of Andover Retirement System

EXHIBIT II

Supplementary Information Required by the GASB – Schedule of Employer Contributions

Plan Year Ended December 31	Annual Required Contributions	Actual Contributions	Percentage Contributed
1995	\$2,418,205	\$2,418,205	100.0%
1996	2,673,721	2,673,721	100.0%
1997	2,911,806	2,911,806	100.0%
1998	2,976,423	2,976,423	100.0%
1999	3,497,014	3,497,014	100.0%
2000	3,646,700	3,646,700	100.0%
2001	3,773,200	3,773,200	100.0%
2002	3,519,677	3,519,677	100.0%
2003	3,623,802	3,623,802	100.0%

SECTION 4: Reporting Information for the Town of Andover Retirement System**EXHIBIT III****Supplementary Information Required by the GASB – Schedule of Funding Progress**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a) / (c)]
01/01/1992	\$20,932,300	\$38,731,000	\$17,798,700	54.05%	\$14,301,400	124.45%
01/01/1995	25,633,700	47,529,000	21,895,300	53.93%	14,390,600	152.15%
01/01/1998	48,767,700	71,163,900	22,396,200	68.53%	20,699,900	108.19%
01/01/1999	59,349,800	76,915,300	17,565,500	77.16%	21,631,400	81.20%
01/01/2001	69,751,700	86,928,000	17,176,300	80.24%	24,595,800	69.83%
01/01/2004	81,431,072	104,231,898	22,800,826	78.12%	92,155,715	78.20%

SECTION 4: Reporting Information for the Town of Andover Retirement System

EXHIBIT IV

Supplementary Information Required by the GASB

Valuation date	January 1, 2004
Actuarial cost method	Entry Age Normal Cost Method
Amortization method	Level dollar for the 1992 ERI and increasing payments (3.0% per year) for the remaining unfunded liability
Remaining amortization period	4 years from July 1, 2004 for the 1992 ERI and 20 years from July 1, 2004 for the remaining unfunded liability
Asset valuation method	5-year smoothing of investment returns greater (less) than expected
Actuarial assumptions:	
Investment rate of return	8.50%
Projected salary increases	6.00%
Cost of living adjustments	3.00% of the first \$12,000 of retirement income
Plan membership:	
Retired participants and beneficiaries receiving benefits	334
Inactive participants	99
Active participants	<u>720</u>
Total	1,153

SECTION 4: Reporting Information for the Town of Andover Retirement System

EXHIBIT VI

Actuarial Assumptions and Actuarial Cost Method

Mortality Rates:

Healthy: 1983 Group Annuity Mortality Table

Disabled: PBGC Mortality Table for Disabled Lives Receiving Social Security Benefits

Termination Rates before Retirement:

Groups 1 and 2 - Rate (%)

Age	Mortality		Disability	Withdrawal
	Male	Female		
20	0.04	0.03	0.06	7.94
25	0.05	0.03	0.09	7.72
30	0.06	0.04	0.11	7.22
35	0.09	0.05	0.15	6.28
40	0.12	0.07	0.22	5.15
45	0.22	0.10	0.36	3.98
50	0.39	0.14	0.61	2.56
55	0.61	0.23	--	.94
60	0.92	0.44	--	--

*Notes: 55% of the disability rates shown represent accidental disability.
20% of the accidental disabilities will die from the same cause as the disability.
50% of the death rates shown represent accidental death*

SECTION 4: Reporting Information for the Town of Andover Retirement System

Age	Group 4 - Rate (%)			
	Mortality		Disability	Withdrawal
	Male	Female		
20	0.04	0.03	0.12	--
25	0.05	0.03	0.17	--
30	0.06	0.04	0.22	--
35	0.09	0.05	0.29	--
40	0.12	0.07	0.44	--
45	0.22	0.10	.72	--
50	0.39	0.14	1.21	--
55	0.61	0.23	--	--
60	0.92	0.44	--	--

Notes: 90% of the disability rates shown represent accidental disability.
60% of the accidental disabilities will die from the same cause as the disability.
90% of the death rates shown represent accidental death.

Retirement Rates:

Rate per year (%)			
Age	Groups 1 and 2	Age	Group 4
55	10.0	50	10.0
56 – 61	5.0	51 – 54	2.0
62	25.0	55	25.0
63 – 66	10.0	56 – 59	5.0
67	100.0	60	25.0
		61 – 64	5.0
		65	100.0

Unknown Data for Participants: Same as those exhibited by participants with similar known characteristics.

Age of Spouse: Males are assumed to be three years older than their spouses.

Percent Married: 100%

Net Investment Return: 8.50%

SECTION 4: Reporting Information for the Town of Andover Retirement System

Salary Increases:

Age	Present salary as a percent of salary at 65	Annual increase rate (%)
20	7.27	6.00
25	9.72	6.00
30	13.01	6.00
35	17.41	6.00
40	23.30	6.00
45	31.18	6.00
50	41.73	6.00
55	55.84	6.00
60	74.73	6.00

Includes allowance for inflation of 4.50%.

Interest on Employee Contributions: 3.5%

Cost-of-Living Increases: 3% on first \$12,000 of retirement allowance

Administrative Expenses: \$108,900 for calendar year 2004, increasing 4.50% per year

Actuarial Value of Assets: A preliminary actuarial value is first determined by taking the actuarial value of assets at the beginning of the year and adding assumed investment earnings (at the assumed actuarial rate of return) and the net new money during the year (contributions less benefit payments and administrative expenses). The difference between the market value of assets and the preliminary actuarial value, less any previous unrecognized adjustments, is recognized in equal installments over the next five years. In order that the actuarial value not differ too significantly from the market value of assets, the final actuarial value of assets must be within 20% of the market value of assets.

Actuarial Cost Method: Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant at Date of Hire. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary.

SECTION 4: Reporting Information for the Town of Andover Retirement System

EXHIBIT VII

Summary of Plan Provisions

This exhibit summarizes the major provisions of Chapter 32 of the Laws of Massachusetts.

Plan Year: January 1 – December 31

Retirement Benefits

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

The annual amount of the retirement allowance is based on the participant's final three-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the participant at retirement:

Age Last Birthday at Date of Retirement			
Percent	Group 1	Group 2	Group 4
2.5	65 or over	60 or over	55 or over
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	--	49
1.8	58	--	48
1.7	57	--	47
1.6	56	--	46
1.5	55	--	45

SECTION 4: Reporting Information for the Town of Andover Retirement System

A participant's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement. The \$30,000 cap on salary used in a benefit determination for any employee hired after January 1, 1979 has been removed.

The maximum annual amount of the retirement allowance is 80 percent of the participant's final three-year average salary. Any participant who is a veteran also receives an additional yearly retirement allowance of fifteen dollars per year of creditable service, not exceeding three hundred dollars. The veteran allowance is paid in addition to the 80 percent maximum.

Employee Contributions

Employees hired before January 1, 1975 contribute 5 percent of their salary; employees hired after December 31, 1974 and before January 1, 1984 contribute 7 percent; employees hired after January 1, 1984 contribute 8 percent; employees hired after July 1, 1996 contribute 9 percent. In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of \$30,000.

Employees hired after 1983 who leave with less than five years of credited service receive no interest on their contributions and employees who leave with five but less than ten years receive one-half the rate of regular interest otherwise payable.

Retirement Benefits (Superannuation)

Participants of Group 1, 2 or 4 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

Participants who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the system).

Ordinary Disability Benefits

A participant who is unable to perform his job due to a non-occupational disability will receive a retirement allowance if he has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the participant retired for superannuation at age 55, based on the

SECTION 4: Reporting Information for the Town of Andover Retirement System

amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the participant's most recent year's pay plus an annuity based on his own contributions.

Accidental Disability Benefit

For a job-connected disability the benefit is 72 percent of the participant's most recent annual pay plus an annuity based on his own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become participants after January 1, 1988.

Death Benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of his death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C (previously, two-thirds of the amount). The surviving spouse of a participant who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. There is also a minimum widow's pension of \$500 per month, and there are additional amounts for surviving children.

If an employee's death is job-connected, the spouse will receive 72 percent of the participant's most recent annual pay in addition to a refund of the participant's accumulated deductions, plus additional amounts for surviving children.

"Heart And Lung Law" And Cancer Presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman or permanent participant of a police department is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

SECTION 4: Reporting Information for the Town of Andover Retirement System

Options

Participants may elect to receive a full retirement allowance payable for life under Option A. Under Option B a participant may elect to receive a lower monthly allowance in exchange for a guarantee that at his death any of his contributions not expended for annuity payments will be refunded to his beneficiary. Option C allows the participant to take a lesser retirement allowance in exchange for providing his survivor with two-thirds of the lesser amount. Option C pensioners who retire in 1988 or later will have their benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

Post-Retirement Benefits

The Board has adopted the provisions of Section 51 of Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first \$12,000 of a retirement allowance. Cost-of-living increases granted prior to July 1, 1998 are reimbursed by the Commonwealth and not reflected in this report.